

Application No. 10/603,007
Amendment dated December 20, 2004
Reply to Office Action of September 20, 2004

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): An apparatus usable with a computer-assisted navigation system, the apparatus comprising:

an instrument;

a support structure releasably engageable with said instrument in a first predefined position and defining two adjacent and oppositely oriented dovetail-shaped projections having a common distal end, said distal end defining a fastener receptacle; and

at least one reference element connected to said support structure in a second predefined position, said at least one reference element being registrable in the computer-assisted navigation system;

said first and second predefined positions and said support structure comprising a first predefined geometry of said at least one reference element relative to said instrument in each of six degrees of freedom; and

a reference array releasably securable to said support structure in a third predefined position and defining a dovetail-shaped recess, said first, second, and third predefined positions and said support structure comprise a second predefined geometry of said reference array relative to said instrument in each of six degrees of freedom; wherein said reference array includes a fastener and is selectively mountable on one of said dovetail-shaped projections and is securable thereon by engagement of said fastener with said fastener receptacle upon said dovetail-shaped recess being engaged with either of said dovetail-shaped projections.

Claim 2 (original): The apparatus of claim 1, wherein:

said instrument includes a first mounting interface;

said support structure includes a second mounting interface; and

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coupling of said first and said second mounting interfaces engages said support structure releasably with said instrument in said first predefined geometry.

Claim 3 (original): The apparatus of claim 2 wherein said at least one reference element comprises at least three nonlinearly disposed reference elements.

Claim 4 (currently amended): The apparatus of claim 3 ~~further comprising a reference array and wherein said at least three reference elements are disposed with said reference array, said reference array being releasably securable to said support structure in a third predefined position, said first, second, and third predefined positions and said support structure comprise a second predefined geometry of said reference array relative to said instrument in each of six degrees of freedom.~~

Claim 5 (currently amended): An apparatus usable with a computer-assisted navigation system, the apparatus comprising:

an instrument including a first mounting interface;
a support structure releasably engageable with said instrument in a first predefined position and including a second mounting interface; and
at least one reference element connected to said support structure in a second predefined position, said at least one reference element being registrable in the computer-assisted navigation system;

said first and second predefined positions and said support structure comprising a first predefined geometry of said at least one reference element relative to said instrument in each of six degrees of freedom;

~~The apparatus of claim 2~~ wherein one of said first and said second mounting interfaces comprise at least one recess and the other of said first and said second mounting interface comprises at least one projection engageable with said at least one recess.

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Claim 6 (currently amended): The apparatus of claim 5 wherein said support structure comprises a bar having two opposite ends, and said ~~first mounting interface~~ second mounting interface is disposed at one of said opposite ends.

Claim 7 (original): The apparatus of claim 5 wherein said at least one recess further comprises a threaded receptacle and said at least one projection further comprises a threaded fastener engageable with said threaded receptacle.

Claim 8 (currently amended): The apparatus of claim 5 wherein said first mounting interface and said second mounting interface define a mounting axis, said at least one recess and said at least one projection being ~~nonsymmetrical~~ asymmetrical about said mounting axis; and wherein engagement of said at least one recess and said at least one projection rotationally fixes said support structure relative to said instrument about said mounting axis.

Claim 9 (original): The apparatus of claim 7, wherein said at least one recess comprises at least two noncoaxial recesses and said at least one projection comprises at least two noncoaxial projections engageable with said at least two noncoaxial recesses.

Claim 10 (original): The apparatus of claim 2 further comprising a reference array wherein said at least one reference element comprises at least three nonlinearly disposed reference elements disposed with said reference array, said reference array being releasably securable to said support structure in at least one additional predefined position; and wherein each of said at least one additional predefined positions define another predefined geometry of said reference array relative to said instrument in each of six degrees of freedom.

Claim 11 (original): The apparatus of claim 10 wherein said support structure comprises a bar having two opposite ends and a third mounting interface for releasably coupling said reference array, said third mounting interface being disposed at one of said opposite ends.

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Claim 12 (canceled)

Claim 13 (currently amended): An apparatus useable to enable an instrument to be used with a computer-assisted navigation system, the apparatus comprising:

a support structure releasably engageable with the instrument in a first predefined position; ~~and~~

at least one reference element disposed with said support structure in a second predefined position, said at least one reference element being registrable in the computer-assisted navigation system; and

a reference array and wherein said at least one reference element is disposed with said reference array, said reference array being releasably securable to said support structure in said second predefined position; wherein said reference array defines a dovetail-shaped recess and said support structure defines two adjacent and oppositely oriented dovetail-shaped projections having a common distal end, said distal end defining a fastener receptacle, wherein said reference array includes a fastener and is selectively mountable on one of said dovetail-shaped projections and is securable thereon by engagement of said fastener with said fastener receptacle upon said dovetail-shaped recess being engaged with either of said dovetail-shaped projections;

said first and second predefined positions determining a first predefined geometry of said at least one reference element relative to the instrument in each of six degrees of freedom.

Claim 14 (original): The apparatus of claim 13 wherein said support structure includes a first mounting interface for releasably engaging said support structure with the instrument in said first predefined position, thereby forming said first predefined geometry.

Claim 15 (original): The apparatus of claim 14 wherein said at least one reference element comprises at least three nonlinearly disposed reference elements.

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Claim 16 (currently amended): The apparatus of claim 14 ~~further comprising a reference array~~ and wherein ~~said at least one reference element is disposed with said reference array, said reference array being releasably securable to said support structure in a second predefined position,~~ said first and second predefined positions defining a second predefined geometry of said at least one reference element to said instrument in each of six degrees of freedom.

Claim 17 (currently amended): An apparatus useable to enable an instrument to be used with a computer-assisted navigation system, the apparatus comprising:

a support structure releasably engageable with the instrument in a first predefined position and including a first mounting interface for releasably engaging said support structure with the instrument in said first predefined position; and

at least one reference element disposed with said support structure in a second predefined position, said at least one reference element being registrable in the computer-assisted navigation system;

said first and second predefined positions determining a first predefined geometry of said at least one reference element relative to the instrument in each of six degrees of freedom;

~~The apparatus of claim 14~~ wherein said first mounting interface comprises at least two noncoaxial projections engageable with the instrument.

Claim 18 (original): The apparatus of claim 17 wherein said support structure comprises a bar having two opposite ends, and said first mounting interface is disposed at one of said opposite ends.

Claim 19 (original): The apparatus of claim 17 wherein at least one of said at least two noncoaxial projections comprises a threaded fastener engageable with the instrument.

Claim 20 (currently amended): The apparatus of claim 14 ~~further comprising a reference array~~ and wherein said at least one reference element comprises at least three nonlinearly disposed

reference elements disposed with said reference array, said reference array being releasably securable to said support structure in at least one additional predefined position; and wherein each of said at least one ~~addition~~ additional predefined positions define another predefined geometry of said reference array relative to the instrument in each of six degrees of freedom.

Claim 21 (original): The apparatus of claim 20 wherein said support structure comprises a nonlinear bar having two opposite ends and a second mounting interface for releasably coupling said reference array, said second mounting interface being disposed at one of said opposite ends.

Claim 22 (canceled)

Claim 23 (currently amended): A method of preparing an instrument having a first predefined geometry for registration in a computer-assisted navigation system, said method comprising the steps of:

- providing a support structure which is accurately and releasably engageable to the instrument in only a second predefined geometry relatively relative to the instrument;

- providing a reference array having at least one reference element disposed therewith, said reference element having a third predefined geometry and being registrable in the computer-assisted navigation system;

- providing said first, second, and third predefined geometries to the computer-assisted navigation system;

- releasably coupling said support structure to the instrument; and

- releasably coupling said reference array to said support structure in a fourth predefined geometry;

- wherein said first, second, third and fourth predefined geometry define a known spatial relationship of said at least one reference element and the instrument in the computer-assisted navigation system; and wherein said reference array defines a dovetail-shaped recess and said support structure defines two adjacent and oppositely oriented dovetail-shaped projections

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having a common distal end, said distal end defining a fastener receptacle, wherein said reference array includes a fastener and is selectively mountable on one of said dovetail-shaped projections and is securable thereon by engagement of said fastener with said fastener receptacle upon said dovetail-shaped recess being engaged with either of said dovetail-shaped projections.

Claim 24 (original): The method of claim 23, wherein the step of releasably coupling said support structure to said instrument comprises:

engaging a first mounting interface of the instrument to a second mounting interface of said support structure in a second predefined geometry.

Claim 25 (currently amended): The method of claim 24 wherein the step of engaging said first and second mounting interfaces comprises:

engaging at least one ~~engagement member~~ projection with at least one ~~receptacle~~ recess.

Claim 26 (currently amended): The method of claim 25 wherein the step of engaging at least one ~~engagement member~~ projection comprises:

engaging a threaded ~~fastener~~ portion of said projection with a threaded ~~receptacle~~ portion of said recess.

Claim 27 (original): The method of claim 24, further comprising the steps of:

providing a third mounting interface on the instrument in a third predefined position; and
removably securing said support structure to said instrument by engaging said first and third mounting interfaces.

Claim 28 (original): The method of claim 24, further comprising the step of:

providing a third mounting interface on said support structure, said third mounting interface for releasably coupling said reference array to said support structure, and said third

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mounting interface having a plurality of predefined positions to which said reference array may be releasably coupled.

Claim 29 (currently amended): The method of claim 24, further comprising the step of:

engaging one of said two adjacent and oppositely oriented dovetail-shaped ~~members~~ projections defined by said support structure with a ~~dovetail receptacle~~ said dovetail-shaped recess defined by said reference array.